Remarks

The Office Action mailed August 1, 2003 has been received and reviewed. Claims 7-10 and 24-27 are pending. Reconsideration and withdrawal of the rejections are respectfully requested.

The 35 U.S.C. §112, First Paragraph, Rejection

The Examiner rejected claims 9 and 24-27 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The traversal of this rejection is respectfully maintained, and respectfully maintain that the claims comply with the enablement requirement for those reasons stated in the response mailed May 27, 2003. The Office is requested to also consider the following remarks.

To begin with, the Action states at page 6 that "the currently named genus encompasses not only an amino acid substitution here or there but the mutation of almost 100 amino acids or a fifth of the total amino acids of the disclosed protein." This statement may apply to pending independent claims 26 and 27, but it is applicants' position that this statement does not apply to pending independent claims 9, 24, and 25.

The Action states that the specification does not support the broad scope of the claims because it does not provide a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. Specifically, it is asserted the specification does not establish (a) regions of the protein structure which may be modified without effecting atrazine chlorohydrolase activity, (b) the general tolerance of atrazine chlorohydrolase to modification and the extent of such tolerance, (c) a rational and predictable scheme for modifying any atrazine chlorohydrolase activity with an expectation of obtaining the desired biological function, and (d) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful (Action, page 5).

Applicants respectfully submit that the requirements described at points a, b, c, and d on page 5 of the Action are not required by the statute, and Applicants are not aware of case law that includes such requirements. The standard for determining if a specification meets the enablement requirement is whether the experimentation needed to practice the invention undue or unreasonable, and "even though the statute does not use the term 'undue experimentation,' it has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation" (MPEP 2164.01, emphasis added). Knowledge of which regions of the protein may or may not be changed is not necessary when making members of the genus of proteins encoded by a nucleic acid sequence that hybridizes or has the percent identity, and the specification provides ample direction and guidance for the skilled person to make proteins within the scope of the claims.

Furthermore, this enablement rejection is implicitly based on the premise that a person of skill in the art produces the enzymes within the scope of the claim by deciding which amino acid(s) will be altered in SEQ ID NO:2, making a protein containing those alterations, and then measuring the activity of the protein. This premise is false. Applicants agree that the skilled person *could* identify proteins falling within the scope of the claims by making them one at a time by, for instance, site directed mutagenesis, and screening them. Applicants also agree that knowledge of which amino acids are tolerant or intolerant to modification could make this type of experimental approach less time consuming. However, the skilled person can also use other methods that do not require *any* knowledge of where to make mutations. Such methods include, for instance, identifying AtzA DNA as described at page 12, lines 6-27, as well as methods that are routine and known in the art.

For at least these reasons, it is respectfully submitted that the requirement that the specification teach "(a) regions of the protein structure which may be modified without effecting atrazine chlorohydrolase activity, (b) the general tolerance of atrazine chlorohydrolase to modification and the extent of such tolerance, (c) a rational and predictable scheme for modifying any atrazine chlorohydrolase activity with an expectation of obtaining the desired

biological function, and (d) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful" (Action, page 5) is arbitrary because such knowledge is not needed by the skilled person to practice the invention.

The Office is requested to reconsider and withdraw the rejection of claims 9 and 24-27 under 35 U.S.C. §112, first paragraph.

The 35 U.S.C. §102 Rejection

The Examiner rejected claims 7, 9, 10, and 24-27 under 35 U.S.C. §102(a) as being anticipated by Mandelbaum et al. (*Applied and Environmental Microbiology*, Vol. 61, No. 4, pgs. 1451-1457, April 1995) as evidenced by DeSouza et al. (*Journal of Bacteriology*, Vol. 178, No. 6, pgs. 4894-4900, Aug. 1996). The traversal of this rejection is respectfully maintained.

The Action states at page 7 that "[a]s this reference does not preclude 'further isolation' which may be necessary so that it can be sequenced . . . ." It is respectfully submitted that this assertion is completely unfounded. This is certainly not what the definition of "isolated and purified" in the specification at page 8 states, nor is this what the definition implies. The definition of "isolated and purified" plainly precludes further isolation which may be necessary so that an "isolated and purified" protein can be sequenced. Proof that the definition plainly precludes such further isolation is evident in the statement "so that it can be sequenced . . . ."

If the Action is correct and the definition of "isolated and purified" at page 8 of the specification does not preclude further isolation, then it necessarily follows that an AtzA protein in a cell extract would be considered isolated. However, the specification specifically addresses the issue of whether an AtzA protein present in a cell extract is considered to be an isolated protein. The specification states at page 19, line 21, that "AtzA protein can be isolated from cell extracts." Thus, the specification explicitly states that an AtzA present in a cell extract cannot be considered to be isolated.

The question that needs to be asked when reviewing Mandelbaum et al. is whether the AtzA protein present Mandelbaum's cell extract is "isolated and purified." The term "isolated and purified" is defined in the specification, which states

> "[a]s used herein, the terms "isolated and purified" refer to *in vitro* isolation of a DNA molecule or protein from its natural cellular environment, and from association with other coding regions of the bacterial genome, so that it can be sequenced, replicated, and/or expressed."

Specification, page 8, lines 22-25. Since the definition of "isolated and purified" requires that the protein can be sequenced, the next question to ask is whether the AtzA protein present in the cell extract taught by Mandelbaum et al. can be sequenced. It cannot. Since it cannot be sequenced, the AtzA protein taught by Mandelbaum et al. is not isolated and purified. Since aach of the independent claims recite "isolated and purified," Mandelbaum et al. do not teach an element of the claims. Accordingly, Mandelbaum et al. do not anticipate the claims.

The Office is respectfully requested to reconsider and withdraw the rejection of claims 7, 9, 10, and 24-27 under 35 U.S.C. §102(a) as being anticipated by the cited art.

The 35 U.S.C. §103 Rejection

The Examiner rejected claim 8 under 35 U.S.C. §103(a) as being unpatentable over Mandelbaum et al. (*Applied and Environmental Microbiology*, Vol. 61, No. 4, pgs. 1451-1457, April 1995) and Kennedy et al. (*Handbook of Enzyme Biotechnology*, 3rd Edition, Wiseman, ed., Ellis Horwood Limited, Hertfordshire, Great Britain, Title page, publication pg. and pgs. 235-310, 1995).

The arguments presented in the Response mailed November 26, 2002, are maintained. The Office is also requested to note that claim 8 is dependent upon independent claim 7. If claim 7 is considered to be not obvious in view of Mandelbaum et al., then dependent claim 8 must also be considered not obvious.

Summary

It is respectfully submitted that the pending claims 7-10 and 24-27 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
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CERTIFICATE UNDER 37 CFR §1.8:
The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Assistant Commissioner for Patents, Mail Stop AF, P.O. Box 1450, Alexandria, VA 22313-1450, on this 1st day of December, 2003, at 1:35 pm (Central Time).

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